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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/680,517	10/06/2000	Hidehito Kubo	043034/0158	9120

22428   7590   06/14/2004

FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER
OPIE, GEORGE L

ART UNIT	PAPER NUMBER
2126	

DATE MAILED: 06/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Offic Action Summary	Application No. 09/680,517	Applicant(s) Hid hito Kubo	
	Examiner George L. Opie	Art Unit 2151	

-- *The MAILING DATE of this communication appears on the cov r sheet with the correspondence address* --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will
  be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this
  communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

1) ___ Responsive to communication(s) filed on _____ .

2a) ___ This action is **FINAL**.   2b) _X_ This action is non-final.

3) ___ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) _X_ Claim(s) _1-46_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) _X_ Claim(s) _40-43 and 46_ is/are allowed.

6) _X_ Claim(s) _1-8, 11-22, 25-32, 37-39 and 44-45_ is/are rejected.

7) _X_ Claim(s) _9-10, 23-24, 31 and 33-36_ is/are objected to.

8) ___ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ___ The specification is objected to by the Examiner.

10) ___ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ___ The proposed drawing correction filed on _____ is: a) ___ approved b) ___ disapproved.

12) ___ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) _X_ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

    a) _X_ All b) ___ Some * c) ___ None of the CERTIFIED copies of the priority documents have been:

        1. _X_ received.

        2. ___ received in Application No. (Series Code / Serial Number) _____ .

        3. ___ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ___ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

14) _X_ Notice of References Cited (PTO-892)
15) ___ Notice of Draftsperson's Patent Drawing Review (PTO-948)
16) ___ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

17) ___ Interview Summary (PTO-413) Paper No(s). _____ .
18) ___ Notice of Informal Patent Application (PTO-152)
19) _X_ Other: Text Docs for USP5,951,634 USP5,774,668

U.S. Patent and Trademark Office
PTO-326 (Rev. 3-98)   Office Action Summary   Part of Paper No. _5_

DETAILED ACTION

1. Request for copy of Applicant's response on floppy disk:
Please help expedite the prosecution of this application by including, along with
your amendment response in paper form, an electronic file copy in WordPerfect,
Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk.
Please include all pending claims along with your responsive remarks. Only the
paper copy will be entered – your floppy disk file will be considered a duplicate
copy. Signatures are not required on the disk copy. The floppy disk copy is not
mandatory, however, it will help expedite the processing of your application.
Your cooperation is appreciated.

Allowable Subject Matter

2. Allowed Claims: 40-43 and 46

3. Claims 9-10, 23-24, 31 and 33-36 are objected to as being dependent
upon a rejected base claim, but would be allowable if rewritten in independent
form including all of the limitations of the base claim and any intervening claims.

4. The U.S. Patents used in the art rejections below have been provided as
text documents which correspond to the U.S. Patents. The relevant portions of
the text documents are cited according to page and line numbers in the art
rejections below. For the convenience of Applicant, the cited sections are
highlighted in the *text documents*. Consistent with Office procedure, the U.S.
Patents corresponding to the *text documents* are also included with this action.

5.   Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for
all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed
or described as set forth in section 102 of this title, if the differences between the
subject matter sought to be patented and the prior art are such that the subject
matter as a whole would have been obvious at the time the invention was made
to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was
made.

6.   Claims 1-8, 11-22, 25-28 and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art (APA) from the Application Background in view of Sitbon et al. (U.S. Patent 5,951,634).

As to claim 1, the APA teaches a load balancing method in a system ("Optimal Load Balancing in Distributed Computer Systems") comprising a plurality of computers (servers) for processing transaction processing requests ("distributing ... messages each requiring small-scale processing") originating from a plurality of terminals, comprising steps of:

a) estimating load states of respective ones of the computers ("processing time of the latest message ... is multiplied by the number of in-process messages on that computer to produce a load index") and

d) determining load distribution among the computers based on the load indexes ("values are calculated at all computers, and a computer with the smallest load index value is selected to process the message").

The APA does not explicitly disclose the additional limitations detailed below.

Sitbon teaches:
b) determining estimated elongation rates of processing time for respective ones of the computers based on the estimated load states ("calculating the progress rate of the load", p3 14-15)
c) calculating load Indexes of respective ones of the computers from the estimated elongation rates ("slope and average of the load calculated", p3 18-21) and
"means for choosing the least loaded server", p3 24-5.

It would have been obvious to combine Sitbon's teachings with the APA because the predictive slope computations increase accuracy of load indications, thereby improving the distributive processing efficacy.

As to claim 2, Sitbon (p5 32-39) teaches measuring load data at constant intervals and estimating an associated load state of the server.

As to claim 3, the APA teaches "the number of jobs at a computer" used to calculate processing metrics in a system, citing Kameda example.

As to claim 4, Sitbon (p5 32-39) teaches the ordered computations and resultant selection substantially as claimed.

As to claims 5-6, note the discussions of claims 2-3 supra.

As to claims 7-8, Sitbon teaches measuring load data at constant intervals and estimating associated load state for each of the servers, p5 32-39.

As to claim 11, Sitbon (p3 14-21) teaches the server progress evaluation as a metric for each of the systems.

As to claim 12, see the APA's teachings on load computations using in-process transaction indexes, and the periodic detection that calculates the load state with respect to the scheduled transactions.

As to claims 13-14, the APA teaches "processing time of the latest message ... is multiplied by the number of in-process messages on that computer to produce a load index value." These measurements are continuously updated to reflect system stats, and it would have naturally flowed from this prior art to use the updates (before/after) each job assignment to show system progress and load state.

As to claims 15-22 and 25-28, note the rejections of claims 1-8 and 11-14 above. Claims 15-22 and 25-28 are the same as claims 1-8 and 11-14, except claims 15-22 and 25-28 are apparatus claims and claims 1-8 and 11-14 are method claims.

As to claim 37, note the rejection of claim 1 above. Claim 37 is functionally equivalent to claim 1, but for the additional recitation that an elongation rate is a ratio of a processing time required for processing a transaction to a net processing time which is a sum of CPU time and an input/output time for processing the transaction. The APA and Sitbon, as discussed supra, clearly show that CPU time and I/O time have been used in combination such that it would have made obvious the estimated load states as claimed.

7.   Claims 29-30, 32, 38-39 and 44-45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the APA and Sitbon as applied to claim 15, and further in view of Choquier et al. (U.S. Patent 5,774,668).

As to claim 29, Choquier (p3 29-48) teaches "Gateway microcomputers... determine the loads of the application servers ... and then passes the service request to the server having the greatest available CPU processing". It would have been obvious to combine Choquier's teachings with the APA as modified because the "service maps" provide an efficient means for updating the other

nodes in the system with load info, thereby facilitating an improved load-balancing efficacy.

As to claims 30 and 32, Choquier (p10 39-45) teaches "every Gateway 126 receives and locally stores a copy of the new service map 136 to determine the states of the servers 120" for load monitoring and assigning. It would have been obvious to combine Choquier's teachings with the APA as modified because the "service maps" provide an efficient means for updating the other nodes in the system with load info, thereby facilitating an improved load-balancing efficacy.

As to claim 38, the APA teaches a load balancing method in a system ("Optimal Load Balancing in Distributed Computer Systems") comprising a plurality of computers (servers) for processing transaction processing requests ("distributing ... messages each requiring small-scale processing") originating from a plurality of terminals, comprising steps of:
estimating load states of respective ones of the computers ("processing time of the latest message ... is multiplied by the number of in-process messages on that computer to produce a load index") and

determining load distribution among the computers based on the load indexes ("values are calculated at all computers, and a computer with the smallest load index value is selected to process the message").

The APA does not explicitly disclose the additional limitations detailed below.

Sitbon teaches:
determining estimated elongation rates of processing time for respective ones of the computers based on the estimated load states ("calculating the progress rate of the load", p3 14-15)
calculating load indexes of respective ones of the computers from the estimated elongation rates ("slope and average of the load calculated", p3 18-21) and "means for choosing the least loaded server", p3 24-5.
It would have been obvious to combine Sitbon's teachings with the APA because the predictive slope computations increase accuracy of load indications, thereby improving the distributive processing efficacy. The APA as modified by Sitbon does not explicitly disclose the additional limitations detailed below.

Choquier teaches "Gateway microcomputers... determine the loads of the application servers ... and then passes the service request to the server having the greatest available CPU processing", p3 29-48 which corresponds to the load balancing device and its position for managing the distribution operations. It would have been obvious to combine Choquier's teachings with the APA as modified because the "service maps" provide an efficient means for updating the

other nodes in the system with load info, thereby facilitating an improved load-balancing efficacy.

As to claim 39, note the discussion of claim 38, with the addition of the "hot redirection technique" taught by Choquier, abstract for redistributing jobs so that they can be "transferred from one application server to another" to dynamically adjust request processing.

As to claims 44-45, note the rejections of claims 38-39 above. Claims 44-45 are the same as claims 38-39, except claims 44-45 are computer program product claims and claims 38-39 are method claims.

8.   The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Specifically, the below reference(s) will also have relevancy to one or more elements of the Applicant's claimed invention as follows:
U.S. Patent No. 6,377,975 to Florman which teaches the load indexing for determining optimal distributions;
U.S. Patent No. 6,006,248 to Nagae which teaches the cetral storage/control of load information and estimations;
U.S. Patent No. 5,881,284 to Kubo which teaches the job selection using evaluations of processing-load indexes.

Contact Information:

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see
http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

☐   All responses sent by U.S. Mail should be mailed to:
       Commissioner for Patents
       PO Box 1450
       Alexandria, VA 22313-1450

☐   Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist). All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses directly to the Examiner.

       The fax phone number for the organization where this application or

proceeding is assigned is 703-872-9306.

       All OFFICIAL faxes will be handled and entered by the
       docketing personnel. The date of entry will correspond to the
       actual FAX reception date unless that date is a Saturday,
       Sunday, or a Federal Holiday within the District of Columbia, in
       which case the official date of receipt will be the next business
       day. The application file will be promptly forwarded to the
       Examiner unless the application file must be sent to another
       area of the Office, e.g., Finance Division for fee charging, etc.

☐   Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at **(703) 305-9600.**

☐   Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (703) 308-9120 or via e-mail at *George.Opie@uspto.gov*. Internet e-mail should not be used where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.

MENG-AL TAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100